UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,876	02/03/2005	Alfred Nordheim	26344	6678

20529 7590 07/15/2009

THE NATH LAW GROUP
112 South West Street
Alexandria, VA 22314

EXAMINER	
BOWERS, NATHAN ANDREW	
ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
07/15/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,876	NORDHEIM ET AL.	
	Examiner	Art Unit	
	NATHAN A. BOWERS	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-39* is/are pending in the application.

4a) Of the above claim(s) *27-39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1) Claims 1-7, 9-18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birch (US 6303387).

With respect to claim 1, Birch discloses a device for applying liquid media that has a plurality of elevations (Figure 2:10) capable of retaining a drop of solution (Figure 2:16) for transportation. Column 3, lines 3-6 indicate that the side surfaces of the elevations are made from hydrophobic materials. Column 4, lines 55-67 further state that the planar elevations are of essentially any cross-sectional polygonal shape. Polygonal shapes such as squares and rectangles have at least two sharp-edged parallel boundaries. Although Birch does not expressly indicate that adjacent elevations are at least 0.5 mm apart, Birch does state in column 8, lines 17-19 that the plurality of elevations are intended to interact with corresponding wells of a common microtiter plate. Since microtiter plate wells are at least 0.5 mm apart, then one of ordinary skill in the art would have known to ensure that the elevations of Birch were likewise at least 0.5 mm apart. Birch further describes in column 6, lines 50-64 and Figures 5 and 6 various liquid volumes the device is capable of transporting on each elevation. Although Birch does not expressly indicate that volumes of 10 to 80 microliters of medium are transported, Birch does indicate that "for larger volumes above 1.0 mm^3, it is necessary that the diameter of the rod be increased." Accordingly, Birch does contemplate increasing the surface area of each elevation in order to transport fluid volumes above 1 microliter. One of ordinary skill in the art would have recognized that each elevation disclosed by Birch could be constructed to transport 10 to 80 microliters by increasing the surface area of the elevations.

With respect to claims 2-5 and 23, Birch discloses the apparatus set forth in claim 1. Birch, however, states that the elevations are generally characterized by a length and width of 1 mm to about 9 microns. See the Table in column 6. Accordingly, the planar elevations of Birch are of a smaller cross sectional area than the planar elevations described in Applicant's claims 2-5.

At the time of the invention, it would have been obvious to make the surface area of the planar elevations larger, such that the elevations are formed from first and second side lengths of 3-9 mm. Column 5, lines 46-57 indicate that the volumes of the drops of liquid to be transferred are a function of the surface area of the elevations. Accordingly, one of ordinary skill in the art would know to construct the elevations of Birch using larger dimensions if it was found desirable to transfer larger fluid drops. One of ordinary skill in the art would know to increase the size of the elevations if they were required to communicate with a multi-well plate comprising larger wells. Generally speaking, side length is considered to be result effective variable that is optimized through routine experimentation. See MPEP 2144.05. It would have been obvious to increase the dimensions of Birch's planar elevations if it was determined that it was desirable to transfer larger volumes of fluid.

With respect to claims 6 and 13, Birch discloses the device set forth in claim 1, wherein the planar elevation is a narrow, elongate elevation. Rectangular polygonal shaped elevations would be characterized as narrow, elongate elevations.

With respect to claim 7, Birch discloses the apparatus set forth in claim 1. Although Birch does not specifically indicate how high each of the planar elevations are, column 8, lines 17-19 state that the height should be sufficient to reach the bottom of a standard well plate. If the height of the wells within which fluid is being deposited are 1-5 mm in height, then it would have been obvious to also ensure that Birch's planar elevations are also 1-5 mm in height. This is due to the fact that the elevations must be able to contact the bottom of the well in order to leave the droplet within the well. Generally speaking, height is considered to be result effective variable that is optimized through routine experimentation. See MPEP 2144.05. It would have been obvious to ensure that the heights of Birch's planar elevations are 1-5 mm if it was necessary to transfer liquid into a well plate characterized by wells having depths of 1-5 mm.

With respect to claims 9-11, 16 and 17, Birch discloses the apparatus set forth in claims 1 and 8. Again, Birch does not expressly disclose the overall dimensions of the support upon which the planar elevations are located, or the distance at which the planar elevations are located from each other. However, one of ordinary skill in the art would know to modify all of these result effective variables in order to correspond to the multi-well plate with which the planar elevations interact. If the multi-well plate comprises wells that are arranged 18 across and 9 down, then it would have been obvious to arrange the planar elevations in a corresponding manner. Likewise, if the multi-well plate comprises wells that are arranged 12 across and 8 down (standard 96

well microtiter plate), then it would have been obvious to arrange the planar elevations in a corresponding manner. Birch teaches in column 1, lines 21-23 that standard microtiter plates usually are formed as 80x125 mm. It would have been obvious to mimic these dimensions in constructing the transport tool (20) so that the transport tool is able to be easily stacked upon the microtiter plate during fluid transfer. All of the dimensions set forth in claims 9-11, 16 and 17 are considered to be result effective variable that is optimized through routine experimentation. See MPEP 2144.05. It would have been obvious to construct the Birch device using dimensions that are reflective of the corresponding multi-well plate in order to increase the efficiency of fluid transfer.

With respect to claim 12, Birch discloses the device set forth in claim 1, wherein the planar elevation comprises acute angles. Many polygonal shapes, such as triangles, employ acute angles.

With respect to claims 14 and 15, Birch discloses the device set forth in claim 1, wherein the planar elevations are constructed from transparent glass and polymer materials. This is described in column 3, lines 1-2.

With respect to claim 18, Birch discloses the apparatus set forth in claim 1, however does not expressly state that the transport tool (20) upon which the planar elevations (10) are positioned comprises at least one grip. Birch does, however,

describe in column 8, lines 5-19 another embodiment in which a planar elevation is attached to a pen-like structural support. It is known in the art that pen-like structural supports include grips to facilitate manual or robotic manipulation. In light of these teachings, it would have been obvious to also include grips on the transport tool (20) in order to improve manual or robotic handling.

With respect to claims 21 and 22, Birch discloses the device set forth in claim 1, wherein the transfer tool (Figure 3:20) is designed to be stacked on top of a multi-well plate (Figure 3:22) during fluid transfer. Each transfer tool is also fully capable of being stacked upon another similar transfer tool.

With respect to claim 24, Birch discloses the device set forth in claim 1. Furthermore, it is inherent that the manual or mechanical means used to operate the transfer tool (Figure 3:20) would be capable of turning the device at any angle after application of the liquid media.

2) Claims 19, 20, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birch (US 6303387) as applied to claim 1, and further in view of Baier (US 5882930).

Birch discloses the apparatus set forth in claim 1, however does not expressly state that the device is configured on a support with a frame.

Baier discloses a reagent transfer device similar to that of Birch in that a plurality of planar elevations (Figure 3:12) are provided for transporting fluid drops (Figure 3:18). This is disclosed in column 3, line 50 to column 4, line 27. Column 4, lines 28-48 indicate that the planar elevations are automatically moved to and from a multi-well plate (Figure 4:14) through the use of a frame assembly (Figure 4:22).

Birch and Baier are analogous art because they are from the same field of endeavor regarding liquid droplet transport devices.

At the time of the invention, it would have been obvious to attach the planar elevations (10) and transport tool (20) disclosed by Birch to a frame assembly. Baier teaches that automated frame assemblies are useful because they operate much quicker and more precisely than manual operations. Automated systems are considered to be well known in the art, and characterized by decreased cost and increased throughput. Although Baier does not expressly disclose the use of 2-4 spars within the frame to hold the planar elevations, this arrangement is considered to be well known. The term “spar” is not specifically defined in Applicant’s specification, and generally is understood to refer to any supporting member in a frame or other structure. Accordingly, the frame assembly of Baier must include a plurality of spars in order to retain and transport the planar elevations.

Response to Arguments

Applicant's arguments filed 14 April 2009 regarding Baier have been fully considered but they are not persuasive.

Applicant's principle arguments are

(a) Birch teaches in column 2, lines 22-24 that the elevations are only capable of accommodating drops having volumes between a thousandth and millionth of a cubic millimeter.

In response, please consider the following remarks.

Column 2, lines 22-24 describe a preferred embodiment of the Birch apparatus. However, Birch additionally teaches in column 8, lines 17-19 and in Figures 5 and 6 that greater quantities of fluid may be applied to the elevations if the surface area of the elevations are increased. Figures 5 and 6 depict the transfer of volumes between 10 and 80 milliliters.

(b) Birch teaches that the tip of each elevation is wettable, i.e., hydrophilic.

In response, please consider the following remarks.

It is agreed that Birch teaches that the tip of each elevation is hydrophilic. However, the claims do not require that the tip must be hydrophobic. Rather, the claims require that the elevation must be made of hydrophobic material. In column 5, line 22-25, Birch states that the body of the elevation is hydrophobic, and that the hydrophobic material is treated by cutting, polishing, abrading or coating in order to create a hydrophilic tip. The claims do not require that every surface of each elevation must be hydrophobic, and therefore read on elevations formed from hydrophobic materials that have had a particular surface treated to create a wettable interface.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN A. BOWERS whose telephone number is (571)272-8613. The examiner can normally be reached on Monday-Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William H. Beisner/
Primary Examiner, Art Unit 1797

/Nathan A Bowers/
Examiner, Art Unit 1797